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ABSTRACT

This paper describes a national project concerning gender equity in teacher education in mathematics, science, and technology. Using a model of external mentors and on-site teams, the Teacher Education Mentor Program (TEMP) worked with seven universities to facilitate the inclusion of gender equity in individual college courses and in college of education programs, policies, and practices. Professor course syllabi from 1996 were compared to their end of project 1999 syllabi as were their 1996 and 1999 written statements on gender equity in their classes. Ongoing professor and mentor interviews were conducted as were site visits. Results indicated greater degrees of institutional change and self reported individual change than changes in syllabi. Reasons for the mixed results and lessons learned are discussed. (Author/BB)

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Using Mentors and Interdisciplinary Teams to "Genderize" Teacher Education

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Abstract

This paper describes a national project concerning gender equity in teacher education in mathematics, science, and technology. Using a model of external mentors and on-site teams, The Teacher Education Mentor Project worked with seven universities to facilitate the inclusion of gender equity in individual college courses and in college of education programs, policies and practices.

In the study professor course syllabi from 1996 were compared to their end of project 1999 syllabi as were their 1996 and 1999 written statements on gender equity in their classes. Ongoing professor and mentor interviews were conducted as were site visits. Results indicated greater degrees of institutional change and self reported individual change than changes in syllabi. Reasons for the mixed results and lessons learned are discussed.

Using Mentors and Interdisciplinary Teams to "Genderize" Teacher Education

Jo Sanders and Patricia B. Campbell

Changing teacher education is never easy, and it is particularly difficult when the change focuses on gender equity, a back-burner issue in most teacher education institutions in the United States despite decades of work showing both the presence and harmful effects of gender bias in the classroom. (i.e. AAUW, 1992; Klein et al., 1994; AAUW, 1998)

It's not as though all the gender problems, particularly in mathematics, science, and technology have been solved. Although we have indeed made real progress in the past 20 years, important gender gaps still exist. While about the same number of young women and men take Advanced Placement (AP) tests in mathematics and more young women take the AP Biology test, young men still outnumber young women in AP Chemistry and far outnumber them in AP Physics and Computer Science. (College Board, 2001). Among the takers of the 1999 SAT-I (Scholastic Aptitude Test I), young women were only 19% of those who planned to go into engineering and 23% of those who planned to go into Computer Science. And males still outscore females on the SAT:Math by 36 points. (College Board, 2000)

After the high school level, the percentage of science and engineering doctorates awarded to women increased only 5 percent in the last ten years, to 31 percent of all such degrees. In four-year colleges and universities, female scientists and engineers are less likely to hold high-ranked positions than men, and are less likely to be tenured. Women are 51 percent of the population but only 22 percent of the science and engineering labor force. (All from National Science Foundation, 1999)

Despite the evidence of an ongoing problem, gender equity tends to be present in the pre-service curriculum only when individual teacher educators happen to feel strongly about it. For example:

- In a Michigan survey of teacher educators statewide, only 11 percent of respondents reported extensive gender equity instruction; 38 percent reported minimal to no such instruction. (Mader, 1994)
- In a national survey of methods instructors in mathematics, science, and technology, three-fourths of the respondents said they taught gender equity, if at all, under two hours per semester. (Campbell & Sanders, 1997)
- In a follow-up survey of Washington State math, science, and technology methods instructors in 1999, Campbell et al. found that somewhat fewer instructors than the earlier national sample said they taught gender equity, and they did so for a mean of 2.5 hours per course, primarily by means of class discussions and modeling equitable behavior. (Campbell et al., 1999)

- In a recent California statewide survey, more than six in ten institutions responding indicated that gender equity instruction was not an integral part of their curriculum. (California Commission on Teacher Credentialing, 1999)

Not surprisingly, in a study of post-1990 foundations textbooks, the author "found little discussion of gender equity, suggesting low interest in this area by educators." (Titus, 1993, p. 38)

In the 80's and 90's, gender equity was often resisted because changing the status quo made people uncomfortable. This is still true. Now, in our work with teacher educators nationwide, we are hearing more and more frequently that students — and all too often faculty, who should know better — also resist attention to gender equity on the grounds that it was all done in the 80's and 90's and that everything is fine now.

Need it be said? Our failure to address gender equity in teacher education now means that in years to come, our daughters and granddaughters will *still* face unnecessarily limited choices, both occupationally and personally.

To counteract this continuing inaction, in the past seven years Sanders has carried out several large-scale projects on gender equity in pre-service teacher education, with Campbell serving as the evaluator. The projects have been funded by the National Science Foundation.

In the Teacher Education Equity Project (TEEP, 1993-1996), we targeted 61 teacher educators in 40 colleges and universities in 28 states who taught methods courses in mathematics, science, and/or technology. We gave them a week-long seminar on gender equity, taught by multiple instructors, and a small amount of money with which to carry out a gender equity project. We followed up with a weekly e-mail summary of who was doing what and a final group conference. The evaluation found that 85% of the participants made major changes in their teaching of gender equity, with men more likely to do so than women. Participants taught a mean of 12 gender equity activities each in their classes, gave a total of 253 presentations, and submitted 40 publications during the project period. In one year they reached nearly 10,000 people with gender equity instruction: pre-service students, colleagues, in-service teachers, K-12 students, graduate students, teacher aides, and parents. (Sanders, Campbell & Steinbrueck, 1997; Sanders, Koch & Urso, 1997)

As successful as this project was, its major shortcoming was in its narrow focus. When only one or two individuals per college or department of education taught gender equity to their students, most students necessarily received no gender equity instruction. And when such an individual changed jobs, all too often the institution they left behind had no source of gender equity expertise at all.

Clearly, focusing on institutional as well as individual change was the way to go. But affecting an institution — how professors teach as well as the

college of education's culture, policies, and procedures — is a very ambitious undertaking. And it cannot be done from the outside.

The Teacher Education Mentor Project

So we developed the Teacher Education Mentor Project (TEMP, 1996-1999), again with Sanders as P.I. and Campbell as evaluator. Teams from colleges of education 1) carried out a needs assessment, 2) attended a seminar, and 3) carried out gender equity activities with a mentor's assistance. Sanders and six teacher educators from TEEP served as mentors[1] to seven colleges of education[2]. The seven institutions were selected based on criteria of diversity in geography and likelihood of success based on answers to questions related to gender issues and activities within their institutions. Each of the seven institutions was allocated $5,000 to defray expenses incurred in implementing the project. Institutional demographics were as follows:

Table I: Institutional Demographics

Undergraduate students *	2 sites: 3,000 to 5,000 students 1 site: 5,000 to 10,000 students 4 sites: over 10,000 students
Teachers graduated annually *	1 site: under 100 3 sites: between 100 and 200 3 sites: between 600 and 700
Geographic location	2 sites in the Northeast U.S. 1 site in the Southeast 2 sites in North Central 1 site in South Central 1 site in the Southwest
Public/private	All 7 sites public
Research university status	5 sites no, 2 sites yes
Location	3 sites rural 3 sites small city 1 site large city

* The sizes of institutions and number of certifications is taken from each institution's 1996 project application.

A short seminar — two and a half days — was held in June 1997 for two team members per team. Advance reading on institutional change was sent out before the seminar. The time at the seminar itself, with three instructors, was spent on gender equity, institutional change, and project planning.

The mentors were at the core of the project. Twenty of the original 61 TEEP participants applied to be mentors, and six were selected based on their

[1] Mentors were: Martha Voyles, Grinnell College; Jenny Piazza, University of Southern Colorado; Jerry Krockover, Purdue University; Leah McCoy, Wake Forest University; Maggie Niess, Oregon State University; Cherry Brewton, Georgia Southern University, and Jo Sanders.

[2] The six institutions that completed the project were: Southwestern Oklahoma State University, Western Michigan University, St. Cloud State University, North Georgia College and State University, Clarion University (PA), and UCLA.

work with TEEP, their skills, and their diversity in terms of sex, race, position, age, and geography. During the project, mentors made five visits to their institutions and kept in close contact at other times. The seven mentors also met among themselves twice a year to make decisions about the project's direction and to brainstorm solutions to problems individuals might have in their sites. The mentors were matched with seven colleges and universities selected from 20 applicants, all of which were from public institutions.

Mentors made about five visits to their sites over the remaining two years of the project on the occasion of team meetings. These meetings were quite variable. At one university they chose to hold their first meeting over two days at an off-campus conference center in the woods. Other meetings were held for an hour or two on campus, some for longer. Meetings themselves were occasions for learning about gender equity, discussion of past accomplishments, problem-solving, and/or planning future activities. Gender equity instruction, either taught by the mentor or guided by the mentor, took place at some but not all sites at the choice of the team leaders. At some sites, teams asked mentors to meet with university officials; at others, teams arranged for mentors to be interviewed by local newspaper or radio reporters; and at some mentors met only with team members.

The mentor's role varied according to how the team envisioned working with a mentor and vice versa, and the team's needs at the time. In addition to on-site visits, mentors kept in close touch with team leaders at other times by e-mail and telephone. In about half the sites, mentors and teams developed strong, warm, positive, even loving relationships. In the others the relationships were serviceable. At most sites, mentors were asked to and did take active roles in team meetings, but at others they were minor participants, and in one case relegated primarily to observer status.

TEMP was designed to permit flexibility across common components. For example, each institution was required to do a needs assessment, but the needs assessment guide contained dozens of techniques to allow choice of method, effort level, and assessment target (teacher education courses, Arts and Sciences courses, and partner K-12 schools). This book was subsequently revised and has been published. (Sanders, 2000) Second, team leaders and teams were self-chosen, consisting of teacher educators, content-area professors, administrators, students, cooperating teachers, supervising teachers, and/or others, and were of varying size. As a third example, while there were no "required" gender activities, the activities had to focus clearly on gender equity for pre-service teachers in math, science, and technology, and had to have promise of continuing impact — thus ruling out, for example, spending all available project money on a one-day conference or a guest speaker with no follow-up activities. We also asked that insofar as possible their activities involve the pre-service teachers themselves. Team leaders had to submit a written plan of their activities, which needed both mentor and project director approval. There was a listserv in use throughout the project, as well as a project web site.

Teams' needs assessment findings can be summarized as follows:

Table II: Needs Assessment Findings

Teacher education programs	• The program addressed other equity issues well but not gender. • Students did not recall any or much exposure to gender equity issues. • Students did not recognize equity education as a part of the teacher education program. • Students believed gender equity is important. • Gender equity was not a part of most syllabi nor of nearly all grades; when included, it was solely at the discretion of the professor. • Faculty did not have knowledge about equity issues nor instructional strategies.
K-12 schools	• Teachers were unaware of gender equity issues. • Teachers believed gender equity is a "no-problem" problem.
Arts & Sciences courses	• Female students were likelier to be encouraged by female than male professors. • Female students said their written work came back usually with either a grade or negative comment; male students reported they usually received positive comments. • Female students reported feeling discouraged from doing math.

The most common finding in teacher education programs was that while faculty believed they were including gender equity in their courses, students when queried reported little to no coverage of the topic. This was a wake-up call for teams.

In the remaining year and a half of the project, equity teams at the universities carried out the following activities to address the problems they had uncovered.

Table III: Gender Equity Activities Carried Out

Activities with students	• Held a program-wide conference on gender equity for all education students. • Held a series of focus group meetings for students. • Worked with pre-service teachers to devise research projects on gender equity. • Added items related to equitable practice to intern teaching form. • Held a workshop for students, who presented the workshop the next year to new students.
Activities with faculty	• Held professional development sessions, workshops, and retreats for faculty. • Invited a gender equity specialist to speak university-wide. • This gender equity specialist also did a workshop for in-service teachers, pre-service teachers, and university faculty.

	• Taught activities from *Gender Equity Right from the Start* (Sanders et al., 1997). • Added gender equity to individual methods course syllabi. • Integrated gender equity into the conceptual framework of the teacher education program. • Held a workshop for science faculty.
Activities with cooperating teachers	• Held a workshop for cooperating teachers • All cooperating teachers used classroom observation tool on biased interactions. All elementary math pre-service teachers used it too.
Other activities	• Added consideration of gender in hiring, promotion, and tenure decisions. • Established a gender equity resource center, including videos. • Held a workshop for graduate teaching assistants. • Established a gender equity web site. • Prepared a booklet on gender equity for faculty, with research done by students. • Set up an internal listserv for members of the equity team. • Made presentations on gender equity in teacher education at local, state, regional, and national professional meetings. • Wrote articles for university, local, and professional publications.

Only two universities spent the entire $5,000 available to them to defray costs associated with these activities. Gender equity is just not very expensive to carry out.

Project Impact

The project was designed to cause institutional change as well as change in individual professors. In order to determine if change occurred, participants were asked to submit their current syllabi with their 1996 applications data and again in 1999 and were interviewed at the end of the project . Participants were also asked to discuss in writing their teaching of gender equity in their 1996 applications and again in 1999 follow-up. [3]

Individual Change Across Sites

Course Syllabi

The 34 faculty providing both pre- and post-syllabi submitted a total of 163 syllabi (86 pre and 77 post) which were examined for the presence or absence

[3] The project began with 66 participants from seven institutions. During the project period 22 more participants were added for a total of 88. Sixty-three participants were interviewed in the third year follow-up for a response rate of 72%. Thirty-four of the 55 participants (62%) who were teaching faculty provided both pre and post syllabi. The percent of team members submitting pre and post syllabi ranged from 12% to 90%. Forty-two of the 55 teaching faculty provided pre and post responded to the gender equity prompt (76%).

of equity in course descriptions, readings, topics covered and assignments. In an earlier project (Sanders et al., 1997) there had been dramatic changes in the syllabi of the participants with the percent of syllabi including gender issues in their course descriptions increasing from 5% to 27% and those including readings on gender equity increasing from 7% to 18%. These changes did not occur in this project. As Table IV indicates, the number and percent of syllabi including equity-oriented readings and equity in the course description actually decreased during the project period.

Table IV: Equity Ratings of Readings and Course Descriptions in Syllabi

	Equity in Readings		Equity in Course Descriptions	
	Pre	Post	Pre	Post
General Equity[4]	8/9%	1/1%	3/3%	4/5%
Gender Equity	8/9%	5/6%	7/8%	3/4%
Multicultural Equity	11/13%	5/6%	20/23%	9/12%
Disability Equity	3/3%	4/5%	3/3%	1/1%

However, an increase was found in the percent of syllabi that included any mention of any type of equity in assignments and topics (38% to 49%). In the earlier project the increase was from 11% to 36%.

The difference between changes in the syllabi of faculty in the two projects may be related to the degree to which this project focused on syllabi change. As part of the earlier project seminar, participants had a session in which, using their own syllabi as examples, they discussed ways to make their syllabi more equitable. While the participants did not like the session, it appeared to have an impact. Ninety-seven percent indicated at the end of the session that they would be changing their syllabus and most of them did. The lack of a similar session for participants in this may in part explain the differences.

Faculty Self-Report of Ways They Address Equity in Their Courses

Participants responded to the following prompt in their project application and again at the end of the project:

> *Please discuss your teaching of gender equity. What circumstances and influences account for your current situation? How satisfied or dissatisfied are you with it? What, if anything, would be needed to change it?*

[4] The term "general equity" was used when syllabi included terms such as *diversity* or *equity* without specifying an area such as gender, race/ethnicity or disability. For example, the following course description was categorized as "general equity": "students will learn how to effectively deal with various kinds of diversity in their classroom, so that all students will experience appropriate challenge and success," while "understanding of diversity issues such as learning styles, linguistic diversity, structural factors in schools, and cultural elements that impact learning" was categorized under "multicultural." If a description or assignment included both gender and multicultural equity, it was counted under both categories.

As was done in the earlier project, project, responses were rated using the following scheme:

0. Not teaching
1. No awareness, negative
2. No awareness, neutral
3. Awareness, but not acting on it
4. Using classroom techniques like cooperative learning with no specific gender focus
5. Some focus on "problems" in math, science and technology, such as classroom interaction
6. Some focus on changing behaviors
7. Some focus on mainstreaming equity
8. Integrating equity throughout the courses
x. Not enough information to make a rating.

Over the major period, mean participant ratings increased from 4.0 to 6.1 ($t=8.29$, $p=.000$), reflecting the change from the earlier project (3.7 to 5.7; $t=10.00$, $p=.000$). Participants' statements indicated great movement from just being aware of gender issues, as the following examples indicate:

Sample I

Pre

Teaching science education…affords me the opportunity to impact the lives of female students from rural areas…I strongly value gender equity. My goal is to create gender equity awareness via in-classroom instruction. Your mentoring support and assessment instruments will enable me to attain my goal…Historically, gender equity has not been a major component of science education courses. Resource materials…have not featured gender equity as a component for classroom instructions. National initiatives promoting gender equity…have not been numerous. I am eager to promote gender equity awareness with equity guidelines and/or standards. In addition, I want to become familiar with methods for promoting knowledge and sensitivity that will lead toward more equitable classrooms.

Post

I use quite a few activities out of the booklet on gender equity through [this project]. Those have…information on accomplishments of females in science and math… I also use statistics…on the number of females and different professional careers. I try and provide particular data for pre-service teachers so they are aware, then try and build a positive attitude towards being gender-bias free in future classrooms. We also try to raise awareness…that teachers sometimes have gender bias but are not aware of it. We us the Dateline[5] tape…Also use the Annenberg[6] tapes on exemplary teaching, so…they can see how other teachers are addressing gender in their lessons, interactions, the way

[5] This refers to a segment from a Dateline program where a teacher's interactions with students are analyzed for gender issues.
[6] Annenberg/CPB Project.

they encourage females to make contributions to the class and the way they mix their cooperative learning groups…

They have some field experiences, and prior to, we again discuss gender bias so they will be conscious of it…look at the different student textbooks and materials…to notice (representations of) gender -free bias…When we do cooperative learning we try to get them to talk about working in groups. Also have newspaper articles brought in, and have to read from a journal, to be aware of what is happening. And when using different resource books to make a unit, we try to get them to include female scientists or something like that… We've talked about the TIMMS and NAEP reports…I'm trying to get them to understand the contributions that females can make in raising those achievement levels…And because we have our students go on the web…they begin to see the different accomplishments…student teachers receive a session of training prior to going out (to practice teach) about gender bias, the individual supervisors like myself are discussing those issues with the student teachers… We are bringing in the cooperating teacher for an afternoon of training in gender equity… The student teachers…keep journals to write down things cooperating teachers are doing, and how students themselves are being biased…

Sample II

Pre

Recently my focus on equity issues in my courses has been on ethnic (racial) equity, not gender equity. I think that gender equity is still a major issue in mathematics and also needs to be addressed. I anticipate that being involved in the Mentor Project will provide me with similar information about gender equity that I can also incorporate into my courses.

Post

The approach that I take, as opposed to saying today is gender equity day, although I do spend a week towards the end of the semester when we look really hard at diversity issues and do a series of readings and activities…it's something that we address as it comes up throughout the course and that's both in the context of things that happen in our course and often as the students are out in school, things that may come up there. …a few weeks ago, one of my students…just before class, was making comments about "I can't do math, it's too hard, I just can't do this anymore, it's gotten too hard for me," she just kept talking about all her math pressures and kept going on for a few minutes. And so we talked as a group…the guys admitted that they had felt that way but they wouldn't say it…that's what often happens in classroom situations, and we talked about the research that these girls tend to have less confidence with their mathematical abilities, and guys tend to be overly confident or are more vocal…

I try to get a sense of the group and where their feelings are and if they seem to understand that there are differences and that they need to be very careful about that, then I don't do explicit things. But if it seems that they don't get it yet, then we do more explicit things. I talk about the study about very well meaning teachers who ignore the female students who are sitting right next to them. We do more explicit things if it seems they don't understand that it's an issue, and if they already understand that it's an issue, as the class goes on I can

ask questions like how are you going to make sure that all of your students are involved, and if they already understand that gender equity, and racial, and socio-economic issues are an issue, then it comes up in a natural way.

Professional Activities

Twenty-three of the participants (37%) from six sites had done anywhere from one to eight presentations on gender equity. Five participants from three sites published on gender equity topics during the project period. Twenty-three participants (37%) also reported doing other grants and projects because of their involvement in the project. In addition, individuals reported honors and promotions that have come to them related to their participation in the project, including an appointment to associate dean and chairing a statewide group of deans. Others gave the project "partial credit" for their promotion and for a national award received in part because of their involvement in the project.

Institutional Change Across Sites

While there was a great deal of change within the individual team members, a second major goal of the project was to foster institutional change. The following results came from site visits, questionnaires and a review of site documentation.

Changes in Student Teacher Evaluation Criteria

By the end of the project, three of the seven institutions had added gender equity components or were in the process of making changes to their student teacher evaluation criteria, including adding gender equity to the rubric used for evaluating education master's portfolios and developing observation and evaluation tools to look at gender equity as part of the "student teacher experience." As one cooperative teacher observed, "[equity] was one thing my pre-service teacher was aware of – who she called on and when...so we discuss it." Another site was in the process of changing the evaluation forms already used in assessing pre-intern and intern teaching and planned to incorporate items related to equitable practice, or to modify related items already included.

Adding or Improving Courses Focused on Equity

In two sites existing courses on equity were changed to relate to courses focused on equity. In one case an existing gender and science course was improved and revised through the instructor's participation in the project, while in a second site a six-hour course offered by another department was cut to a three-hour course, because education courses were already covering so much of the gender equity material.

Standardized Changes in Curriculum Across Courses

Six of the seven institutions reported movement to include more gender equity in courses. Examples of the changes include: having issues related to

gender and women included throughout Mathematics Methods courses rather than just having a "Gender Equity Day," changing a syllabus for Introduction to Education and Instructional Strategies and Management to include topics on gender issues, and having education students purchase and use *Gender Equity Right From the Start*, a resource book written by Sanders. At one site it was felt that "instructors of the methods courses are very conscious about including gender equity when issues of social justice are discussed. Since our focus is social justice, we infuse social justice in our courses, and now gender equity is part of that."

Changes in Evaluation Criteria for Professors

Two institutions said that the project either had or will effect changes in faculty evaluation criteria. At one site, for instance, a team member said the education department added "Did the professor treat all students fairly?" to the evaluation forms students complete. At another, project participants were asked to participate in the next revision of faculty evaluation forms, and they intended to include a question about equity.

Changes in Faculty and Teaching Assistants (TA) Orientation

Change in the training of TA's was occurring at two institutions. One site was formalizing a handbook that included issues on gender equity to be used in TA orientations, while another side was including more gender equity training in TA orientations, particularly in the teaching of mathematics and science. No institutions mentioned any change in orientations held for new faculty.

New Annual Conference, Equity Day, or Symposium

While most sites offered workshops in gender equity of some kind during their involvement with the project, three sites mentioned gender equity workshops or day-long conferences which they planned to continue offering yearly – each focused on a different audience. The first was planning to continue a professional development workshop for faculty members they did under the project, while the second planned to continue an equity day for student teachers. The third planned to continue to hold a series of workshops on gender equity for cooperating teachers, block students, student teachers, administration, and faculty. In addition at this site, a Leader/ Presenter Development project was continuing in which block students and student teachers are trained to present gender equity workshops for the next semester's students and for others involved in the teacher education program. One participant from this site also mentioned an annual symposium on story-telling from gender and ethnic perspectives that began during the project period.

Promotion and Tenure

Participants from five sites felt that the project had positive effects on some aspect of faculty promotion and tenure although no one indicated "official" changes in policies and procedures. However, participants from three sites who

were part of their institution's promotion and tenure decision-making process said they felt that participation in the project would have a positive effect on a faculty member's chance for promotion and/or tenure.

Hiring

Participants from three sites thought the project would have an effect on hiring decisions, although not in terms of any changes in policies and procedures. One is site is now looking to hire more female professors and especially looking for people interested in gender issues.

Change by Institution

Not surprisingly, the amount of individual and institutional change varied by institution, although there was some institutional change within all six sites that remained in the project and individual change at all sites, including the site that dropped out.

Table V: Individual Change

	Site A	Site C	Site B	Site E	Site D	Site F	Site X
Any equity in Post Course Syllabi*	4/29%	6/60%	1/4%	6/33%	2/22%	6/27%	1/100%
Positive Changes in Equity Statements**	8/73%	3/50%	3/75%	5/83%	2/67%	10/100%	2/100%
Team Members Reporting Equity Based Presentations	10	2	0	4	4	2	1
Team Members Reporting Equity Based Publications	2	1	0	0	2	0	0
Team Members Reporting Grants and Projects Based on TEMP	5	5	2	4	4	2	1

*% are based on number of participants for whom there were post syllabi
**% are based on number of participants for whom there were rated pre/post equity statements.

Table VI: Perceived Change by Institution

	Site A	Site C	Site B	Site E	Site D	Site F	Site X
Student Teacher Evaluation	x	x		x*		x	x*
Adding Equity Course		x		x			
Departmental Curriculum Change	x	x	x	x	x	x	
Hiring, Promotion & Tenure	x	x		x	x	x	
Professor Evaluation	x		x				
Faculty/TA Orientation		x				x	
New Annual Equity Day	x				x	x	
Cooperating Schools	x	x			x		

* Gender equity was a criterion included in student teacher evaluations prior to the project.

While there were a number of institutional changes across the six sites that remained in the project, similar changes were not reported in interviews with faculty members from five institutions that applied to the project and were not accepted. Although these faculty were asked about all the possible areas of change indicated earlier, over the three year period, the only institutional changes concerning gender equity were related to the hiring practices at two of the institutions. In one institution, all the new faculty hired in the college of education have been women because of the current and past deans' interest at impacting the college "in this way," while another said they now welcome women and minorities as faculty.

Lessons Learned

1. *A longer seminar was needed.*

The original thinking was that the mentors would provide the bulk of the gender equity teaching to teams, which is why such a short seminar was planned. It did not generally happen, and not because mentors were unqualified to do so. Some mentors felt that teams should take major responsibility for their own learning, believing the role of facilitator was more appropriate than the role of teacher in this case. In some cases there was insufficient time available for anything approaching comprehensive learning. In others, teams preferred to explore the subject on their own without the mentor's help at all, and in still others there appeared to be low interest in learning much about gender equity. In short, no two were alike on this score.

Under these circumstances, it would have been more expensive but better to hold our usual five- or six-day seminar. All or most team members and not just the team leaders could have been included, thereby establishing the face-to-face contact that is so important. Team members could have had a high quality baseline education in gender equity issues, concepts, and research. Mentors could have better spent their time with teams building on knowledge rather than trying to deal with lack of it.

2. *Mentor preparation was needed.*

Because all mentors were teacher educators who were "alumni" of the earlier Teacher Education Equity project, we knew they were good teachers, knowledgeable about gender equity in teacher education, and experienced at implementing it in their own colleges or departments of education. We thought this was enough preparation to be a mentor, and at the sites where team leaders were effective and team members were motivated, it was. It was not so, however, at other sites. In those cases, it would have been helpful to prepare ourselves with literature on mentoring, and probably to arrange for someone who knew a great deal about mentoring to come and teach us. We compensated

as best we could by asking each other for advice and this was helpful, but not as much as being more prepared would have been.

3. *Team leader preparation was needed.*

We assumed, mistakenly, that self-chosen team leaders at universities would necessarily be capable of leading teams well. It became clear that some were far more knowledgeable and skillful than others in what to do, how to do it, and when to do it. Were we to repeat the project, we would hold a training session in group facilitation skills for team leaders.

4. *Better understanding of the role of university culture was needed.*

Looking back now at the mentor/site matches, in some cases where developments left something to be desired — although not all — a clear issue was a mismatch between the mentor and the site. We paired them on the basis of some characteristics that proved to be less important than others. Confidentiality prevents us from being more specific, but were we to do this project over again a question on the university application would be to spell out their expectations of their mentor, including informal ways the team is comfortable working, to make possible a tighter site/mentor match. We would also ask mentors to make their first site visit one of pure observation, in an attempt to assess the site's culture directly.

Having said this, however, we believe that the flexibility within major project components, the mentors, and the self-chosen teams were very important reasons for the success of the project.

By necessity, the changes reported are short term. The overall project was for only three years and the participation of the six institutions was only for two years. Follow-up is needed in the next two or three years to determine if existing changes continued and if new changes were instituted.

That change occurred is clear; why change occurred is not. While time is needed to see if changes begun under the project continue and expand, it is clear that a project that brings together knowledgeable mentors with teams of faculty and others with a clear purpose can provide pre-service teachers with an environment and an education that is more sensitive to gender equity issues in math and science.

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